

## Cryopreserved Embryos in the United States and their Availability for Research

**Objective:** To determine the number of embryos stored at assisted reproductive technology (ART) clinics in the United States and their current disposition.

**Design:** A targeted survey instrument sent by the SART–RAND team to all medical practices providing in vitro fertilization services in the United States.

**Result(s):** The SART–RAND team surveyed all 430 ART practices in the United States. Of these practices, 340 returned surveys for analysis. The data from these surveys were merged with data taken from the 1999 SART dataset, which contains information about practice size and success rates. Responding clinics reported

a total of 396,526 embryos in storage as of April 11, 2002. The vast majority of the embryos (88.2%) were targeted for patient use. Small numbers of embryos were available for research, donation, destruction, quality assurance, or other uses.

**Conclusion(s):** Nearly 400,000 embryos are stored in the United States, the majority of which (88.2%) are targeted for patient use. Few are available for research (2.8%), limiting possible conversion into embryonic stem cell lines. (Fertil Steril\_ 2003;79:1063–9. ©2003 by American Society for Reproductive Medicine.)

**Key Words:** IVF, ART, cryopreserved embryos, cryopreservation, stem cells

In this article the authors describe the results of survey data they obtained from assisted reproductive treatment facilities in the United States. Until this study there was no comprehensive measurement of the number of embryos in the country or their availability for research. This study was conducted in April of 2002. The researchers sent surveys to 430 clinics and received 340 returned surveys. These surveys asked primarily about the cryopreservation and disposition (reason for preservation). 290 of these survey results were combined with data from 1999 which primarily described basic parameters (eg. number of treated women and number of live births). From these 290, the largest responding clinic had made 3,204 in vitro attempts, the smallest attempted eight. Instances of live births for women under 35 ranged from 0% to 67%, with a median of 31%.

They found that the vast majority of clinics have onsite storage with only 17/340 storing embryos offsite. The total number of combined embryos in storage is 391,661. Before storage couples are asked to sign a consent form which indicates the purpose of storage. Of the nearly 400,000 embryos, 87% were being held for patient use. 1% were stored for quality testing, about just over 2% were awaiting destruction. Under 3% had been designated for research. 4% were being kept for “other” reasons, such as death of the patient or divorce.

The authors attempt to estimate how many embryonic stem cell lines could likely be isolated from the 11,283 embryos designated for research. After long term cryopreservation some embryos fail to thrive upon thawing. The authors estimate that 65%, or 7,334 would survive the freezing process, and of these 25% or 1,834 would develop into blastocysts. Only a fraction of embryos that thrive produce stem cell lines. The authors estimate that 15% of the thriving blastocysts, or 275, would form stem cell lines. Therefore the 391,661 cells currently in storage represent only about 275 potential stem cell lines.